

## Germanate gate dielectrics for semiconductor devices

### ABSTRACT OF THE INVENTION

A structure, and method of fabrication, for high performance semiconductor field  
5 effect devices is disclosed. These devices are having a gate dielectric containing a  
germanate material. In representative embodiments the gate dielectric is essentially a  
layer of a germanate material. The chemical composition of such materials is  $\text{Me}_z\text{Ge}_x\text{O}_y$ ,  
where Me stands for a metal with high ion polarizability, and x, y, and z are non-zero  
integers. Such a gate dielectric is advantageous, from the point of view of dielectric  
10 constant, barrier height, carrier mobility, thermal stability, and interface stability.